

## **GAS DISTRIBUTION SHOWERHEAD FEATURING EXHAUST APERTURES**

### **ABSTRACT OF THE DISCLOSURE**

Embodiments in accordance with the present invention relate to systems and methods for distributing process gases over the surface of a workpiece. In accordance with one embodiment of the present invention, process gases are flowed from a source to a workpiece surface through a gas distribution showerhead defining a plurality of orifices. The gas distribution showerhead also features a plurality of exhaust orifices for removing material above the wafer surface. The supplemental exhaust afforded by the showerhead exhaust orifices serves to reduce variations in gas velocity attributable to radial flow across the wafer surface, thereby enhancing the uniformity between resulting processing at the wafer edge and center. The ratio of the distribution and exhaust aperture areas may vary or remain constant across the faceplate. Additionally, the size and number of distribution and exhaust apertures may be selected to optimize gas distribution across the semiconductor wafer surface.

60056022 v1